

U.S. DEPARTMENT OF ENERGY

TECHNICAL REPORT

Program/Project Title

**ALASKA OIL AND GAS EXPLORATION, DEVELOPMENT,
AND PERMITTING PROJECT**

Reporting Period

October 1, 2002 through March 31, 2003

DOE Award Number.

DOE-FC-26-02NT15446

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Date of Issue:

August 4, 2003

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ABSTRACT

Alaska Oil and Gas Exploration, Development and Permitting Project

The objective of this project is to eliminate three closely inter-related barriers to oil production in Alaska through the use of a geographic information system (GIS) and other information technology strategies. These barriers involve identification of oil development potential from existing wells, planning projects to efficiently avoid conflicts with other interests, and gaining state approvals for exploration and development projects. Each barrier is the result of either current labor-intensive methods or poorly accessible information. This project brings together three parts of the oil exploration, development, and permitting process to form the foundation for a more fully integrated information technology infrastructure for the State of Alaska.

This web-based system will enable the public and other review participants to track permit status, submit and view comments, and obtain important project information on-line. By automating several functions of the current manual process, permit applications will be completed more quickly and accurately, and agencies will be able to complete reviews with fewer delays.

The application will include an on-line diagnostic Coastal Project Questionnaire to determine the suite of permits required for a specific project. The application will also automatically create distribution lists based on the location and type of project, populate document templates for project review start-ups, public notices and findings, allow submission of e-comments, and post project status information on the Internet.

Alaska has nearly one-quarter of the nation's supply of crude oil, at least five billion barrels of proven reserves.¹ The American Association of Petroleum Geologists report that the 1995 National Assessment identified the North Slope as having 7.4 billion barrels of technically recoverable oil and over 63 trillion cubic feet of natural gas. From these reserves, Alaska produces roughly one-fifth of the nation's daily crude oil production, or approximately one million barrels per day from over 1,800 active wells.²

Currently, State of Alaska agencies use multiple, independent systems to identify, authenticate, and authorize customers for online transactions. Consumers of online state services may be required to manage multiple online "profiles," and during a permit review process valuable time may be lost verifying identity or reconciling differences in applicant information when agency records disagree. The state's Information Technology Group is developing a shared applicant profile system that will provide an additional opportunity to demonstrate data sharing between agencies.

1 DOE Energy Information Administration: <http://tonto.eia.doe.gov/oog/info/state/ak.asp>

2 American Association of Petroleum Geologists: <http://www.aapg.org/divisions/dpa/npra/html>

Objectives

The key objectives are:

1. Create opportunities for companies to make new assessments of oil potential from improved organization and presentation of existing public well data.
2. Create a foundation for electronic permit review processes that is shared among related agencies and the public and results in 'smarter' projects approved in less time.
3. Use geography as an organizing principal to bring shared interests together to manage data logically, consistently and efficiently. This will streamline retrieval of critical land status and resource information for faster and 'smarter' exploration, development and permitting.

Methods

This project uses the following methods:

1. Provide public subsurface geo-science and engineering information (e.g. well logs) on-line
2. Develop an on-line diagnostic to determine and access required permit applications.
3. Build web-based software for automating the mechanics of coordinated ACMP consistency reviews and storing permit information in a publicly accessible database.
4. Build a cooperative multi-agency geographic information system (GIS) for sharing land status and resources data to support oil and gas planning and permitting decisions.
5. Create an on-line customer identity management system that is shared among agencies.

Progress

Task 1 is on track to meet goals and schedule. Initial geotechnical publications with GIS capability are planned for production in early 2004.

Task 2 is modified by the Governor's structural changes to the permitting process. These changes strengthen the overall goal of improved permitting but will require additional time to implement the software and procedures defined by the grant.

Task 3 is progressing on track. Enterprise GIS components are planned for rollout in the last quarter of 2003 and into the first quarter of 2004.

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EXPERIMENTAL

Not applicable. This project includes no experimental research data.

RESULTS AND DISCUSSION

Reporting period October 10, 2002 and March 31, 2003.

Task 1: Deliver On-Line Subsurface Geoscience and Engineering Information

Task 1 addresses the issue of public access to well data. The task is described in a series of discreet steps, presented as a sequence of specific deliverables created over the two-year time span. This project will integrate existing database and GIS technology and develop Internet-based tools that will ease and speed exploration for oil and gas. The Task 1 project team will make public well data readily available worldwide via the Internet, 24 hours per day, 7 days per week using a simple, map-based GIS interface or direct text-based query. Data will include well description (well header data), well production and injection records, well files, digital log curves, deviation surveys, and possibly Alaska Oil and Gas Conservation Commission orders, and reports available at Alaska's Geologic Materials Center.

Task 1 will provide, to the public and permitting agencies, well data that is as complete as possible and in industry standard digital formats. This will save years of effort in providing the public with this information. Expanded access will translate into new analysis, new opportunity, and new production. The web site will be updated regularly as new public data becomes available. AOGCC will integrate regular updating into its business processes.

Technical Status of Discreet Task 1 Steps:

Task 1.1 - Deliver Directional Data On-line

Developed software to verify existing directional data and used this software to quality control approximately 90 percent of the existing, non-confidential directional surveys in preparation for public distribution. GIS front-end has been prototyped.

Task 1.2 – Load Well Header Data and Build Query Indexing System

Software was developed to download well header information to AOGCC's subsurface application software. AOGCC also developed software links between our image library and well specific information including well header information contained in the Relational Database Management System (RBDMS) database. This software utilizes user-selected criteria from the RBDMS database to search for documents from the AOGCC's image library. The application will provide the means for creating compound searches using more than one criterion. A contractor is being selected to build the web interface program. Once in production, the database will be updated by AOGCC as part of on-going operations.

Our goal is to allow users to select wells based on well specific information including heading information or on geographic information.

Task 1.3 – Web-Enable Well Production and Injection Records

Production and injections records are now organized within in RBDMS, where they are readily available to AOGCC staff. Web-enablement contracting in progress.

Task 1.4 – On-line Access to Well File

2,986 Well History Files (385,703 pages) were digitized in bitonal format and placed on-line (intranet) during the reporting period.

Digitizing of public well history file information will be completed (bitonal) and transformed into a Web enabled format during the next reporting period. Public access to this data is dependent on purchasing, enabling, and configuring a public server.

We will begin the bitonal digitizing of the Administrative and Field files (includes AOGCC Orders [task 1.7]). Planning will commence for the future digitizing of color, grayscale, large format documents, and mud logs in order to complete the digitization of the Well History files. Various technical questions and choices relate to the storage and practical display of large image files. No unusual problems are foreseen, although technical support is required. Progress is anticipated to be steady, but slow (eighteen or more months to complete).

We are expanding this task to include select AOGCC administrative and field files for public distribution through our web site.

Task 1.5 – Web-Enable Digital Well Log Data

Digital data are formatted for distribution. Software allowing selection of data and automation of delivery is under development.

Task 1.6 – Purchase Pre-1986 Log Curves of Exploration and Development Wells

AOGCC, in-conjunction with the Alaska Department of Natural Resources' Division of Oil and Gas, prepared a listing of 669 pre-1986, exploratory wells that lack digital well log data. A request for proposal was published for the scanning and digitizing of these well logs, and several responses were received. In the meantime, BP Exploration (Alaska), Inc. came forward with an offer to provide some of these digital data, and ultimately donated the digital data for 280 wells. Subsequently, ConocoPhillips Alaska, Inc. offered to donate digital well log data for the remaining wells. The number of wells we will ultimately buy data for is contingent on the scope of the ConocoPhillips donation.

Task 1.7 – Web Publish Commission Orders

AOGCC's web site has recently been re-designed and updated, and makes our orders readily available to the public. AOGCC's home page, at <http://www.state.ak.us/local/akpages/ADMIN/ogc/homeogc.htm> , now contains links to available data including orders and decisions, which are available through an easy-to-use

index page at <http://www.state.ak.us/local/akpages/ADMIN/ogc/orders/ordindex.htm>. This allows the user to quickly locate different categories of orders (Aquifer Exemption, Area Injection, Conservation, Disposal Injection, Storage Injection, or “Other” orders). Each order can be viewed on-line and can be easily saved by the user as an HTML or text file.

Performance Variances, Accomplishments, or Problems

1. Task 1.6 Purchase digital Log Curves Pre '86: Final negotiations stage, contract expected by 6/1 to begin data delivery. Request for proposal for log digitizing being re-evaluated due to sizable industry contributions of digitized log data. Budget on line for full expenditure.
2. Tasks 1.1-1.5 GIS Interface Progressing. Specifications complete, pilot project / proof of methods complete, contract prepared and negotiations complete. Contract signature pending approval of Task Order Contract. GIS interface work expected to begin in late May and prototypes available by October.
3. In-kind match work progressing well. Scanning of AOGCC wellfiles fully operational, 3-4 completion projection. AOGCC web site updates underway to make approved information available. See progress at:
<http://www.state.ak.us/local/akpages/ADMIN/ogc/homeogc.htm>

Task 2: Automate Manual Processing Aspects of ACMP Project Consistency

Following our submittal and the approval of this grant, the Governor initiated significant change to the coastal permitting processes which incorporates most all oil and gas activity.

The Governor issued an executive order introducing the change in policy and function, and followed with proposed legislation. The Alaska Legislature passed a final version of the bill. To read the Governor's Executive Order #106 see <http://www.state.ak.us/local/eo106.pdf>.

The Governor proposed legislation to then change the Alaska Coastal Management Program. Elements of consistency review as described in the DOE grant application were retained. This news bodes well for moving forward with development of a slightly modified version of the decision support system contemplated in the grant application and software requirements specification (SRS).

New legislation was passed. The new law is available on-line at <http://www.legis.state.ak.us/pdf/23/Bills/HB0191D.PDF>. The first two introductory findings are presented below, and demonstrate that the legislative intent is aligned with the goals of this Department of Energy Project:

Section 1. The uncodified law of the State of Alaska is amended by adding a new section to read:

FINDINGS. The legislature finds that

(1) the Alaska coastal management program (ACMP) is intended to function with a minimum of delay and avoid regulatory confusion, costly litigation, and uncertainty regarding the feasibility of new investment;

2) there is a need to update and reform the existing statewide standards of the ACMP so that they are clear and concise and provide needed predictability as to the applicability, scope, and timing of the consistency review process under the program; ...

As a result of the Executive Order and the Coastal Management Programs Statute; new regulations must be written and adopted. This work is the responsibility of the Office of Project Management and Permitting within the Alaska Department of Natural Resources.

Based upon interpretation of the statute, it is clear that significant components of the original Software Requirements Specification Document will apply to the new process. There is adequate overlap with the first step of delivering a well formed Coastal Project Questionnaire (CPQ) that this work will start moving forward. Modifications based on new regulatory direction can be incorporated as needed.

Appendix 1 includes business process flow charts and coastal questionnaires that will be used in the development of the system. Further, additional use cases were developed for submitting the Coastal Project Questionnaire (CPQ). Coordination efforts with DNR, DEC and the Information Technology Group were initiated on the approach for developing an electronic CPQ. Senior Policy work on permitting is helping to place greater emphasis on infrastructure and basemap which ties to the integrated DOE goal of utilizing GIS within a business process environment to speed the flow of required information.

Task 3: Create a Shared Geographic Information System Among State Agencies

Task 3.1 Establish GIS Hardware and Commercial Software Infrastructure

The project goal is to implement GIS at an enterprise level among participating agencies. Planning documents were prepared and shared with project candidates. Meetings in Anchorage and Juneau completed. A final proposal has been advanced to the match-fund groups committed to the eGIS goal. Negotiations with vendors is complete, and a deployment model is in place to provide oil and gas mapping and permitting infrastructure. Work is being coordinated with participants via periodic meetings.

Following the planning meetings with other departments, the consolidation of permitting groups with DNR by the governor, and planning sessions with ITG, a decision was made to initially roll out the eGIS from a base within the department of Natural Resources. Departments will have an agency neutral domain from which to develop shared GIS

applications (eg. Alaskadata.info or data.alaska.gov). Project costs and time to market were key issues. Coordination with state data center will be maintained. Complementary work on USGS – Alaska MOU to support basemap / framework data layer support initiated with support from DOE Pump III objectives for eGIS.

Task 3.2 TIC Approved GIS Policy Document

Meetings with IT Managers from the statewide Information Technology Group were completed. The senior IT management level has not yet formed in the new administration. Recent documents indicate such planning is getting underway for fall 2003, and eGIS is an agenda item of senior IT policy. Draft policy work is underway at DNR to contribute to the eGIS implementation. Contact made with the OGC Consortium, membership is planned to better align DOE objectives with OGC technical methods.

Task 3.3 Data Load

DOE funding is contributing to State Contract Task Order #16 that will assure the loading of enterprise GIS basemap, land ownership, and land status information to Oracle Spatial and an enterprise quality geodatabase. Required update control procedures are in place to assure information is efficiently maintained within a production environment.

Task 3.4 AOGCC Web Front End

GIS publishing work is moving forward at AOGCC under Task1. A decision was made to move forward with the Task 1 contractual work to bring that capability forward with the shortest time to market, and assure compatibility with the task 3 work via data standards and data access. Interface support under task 3 is moving forward via raster image basemap support (e.g. Landsat7 basemaps with lease boundary and infrastructure overlays are planned.)

Task 3.5 DGC Support

The Executive Order moving DGC out of the Governor's Office to DNR resulted in a new name and new functions: the Office of Project Management and Permitting (OPMP). OPMP is a lead partner in the initial rollout of the shared GIS. Good collaboration and alignment of essential resources toward common goals.

Task 3.6 Complete Fisheries Atlas

Cartographers have finished the first run through all annotation for the Arctic region and those maps have been edited and corrected. The geo-database for the Interior Region has been created and the cartographers have begun annotation work on the maps. No anticipated delays in delivery. Habitat and Restoration Division was also changed by executive order of Governor; transferring regulatory authority from ADFG to DNR with no significant impact to the work described by task 3.6.

Please See APPENDIX 3 for the more detailed planning document supporting Task 3 implementation.

CONCLUSION

Clearly a new technology driving the GIS component that threads of all three tasks is the migration from 'file based GIS' to a relational database. The move into relational structures takes care and effort to assure no lost functionality, and to the extent possible, an open structure that allows multiple commercial geo-software providers the ability to read and write to that database. This broad goal of the Open GIS Community must be tempered with system requirements that call for 5 second or less response time. It may not be possible to meet that requirement in today's environment of mixed standards and vendor specific data models. But that is not a conclusion we are willing to concede at this point in the project.

The second big challenge is to assure low level change to on-going business practices that take full advantage of the automated solutions and improved database model. GIS updates and data controls must be modified to function directly against the relational database. Contracts and project plans for all tasks address this challenge and the project team is quite aware of the importance.

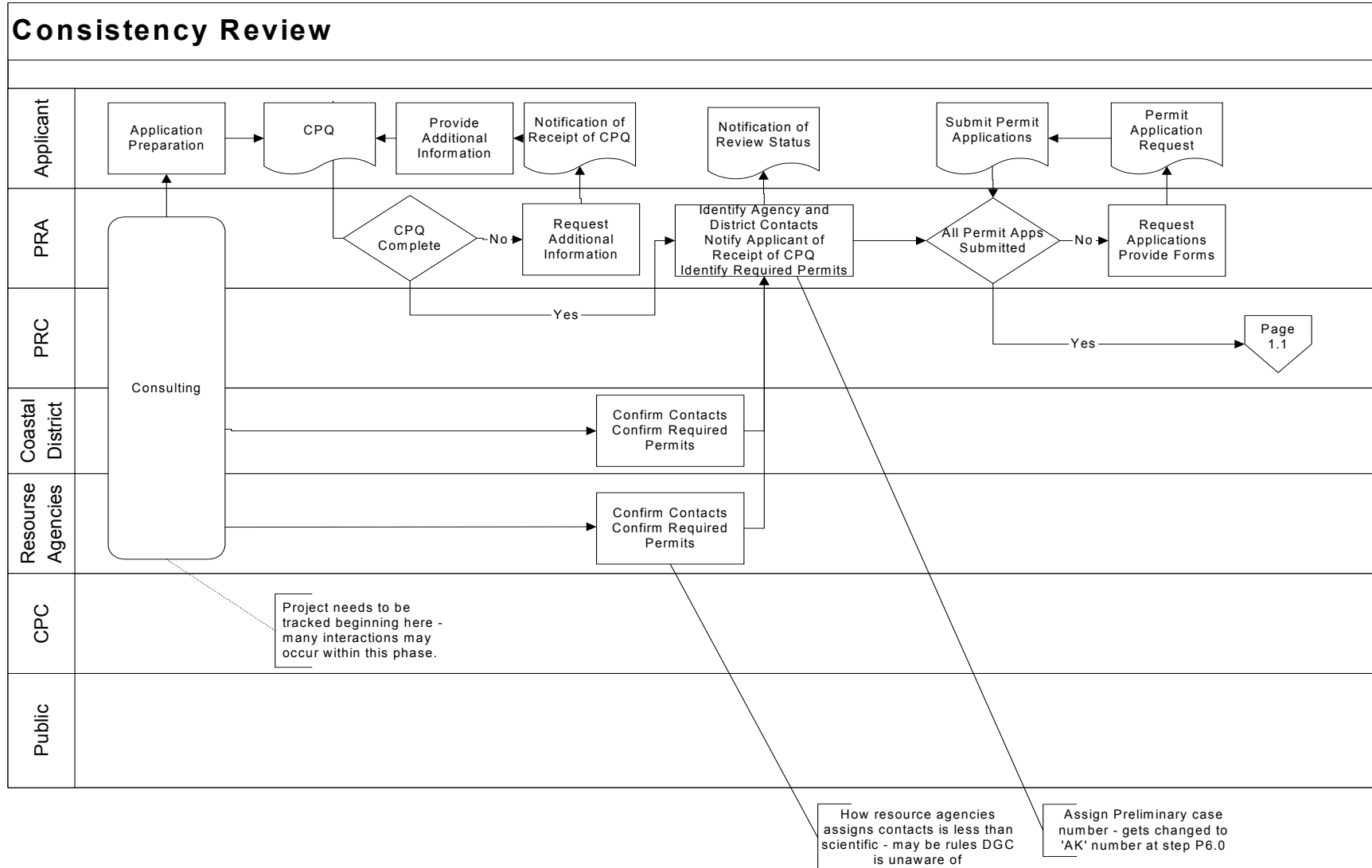
A third challenge is in the area of training and advertising. We must make sure the targeted audiences are aware of any new offerings and are in a position to take advantage of them. Communications with the Governor's Office on the progress of this grant, strategic alignment with overlapping projects, press releases of major milestones, articles in industry publications, and a certain level of 'self-help' to the new websites will all contribute to this goal that helps assure successful assimilation of the products.

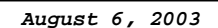
- **APPENDIX 1: TASK 2: SOFTWARE REQUIREMENTS SPECIFICATION:**
Consistency Review Flow Chart
- **APPENDIX 2: TASK 2: SOFTWARE REQUIREMENTS SPECIFICATION:**
Coastal Project Questionnaire Instructions
- **APPENDIX 3: TASK 3: SHARED GEOGRAPHIC INFORMATION SYSTEM**

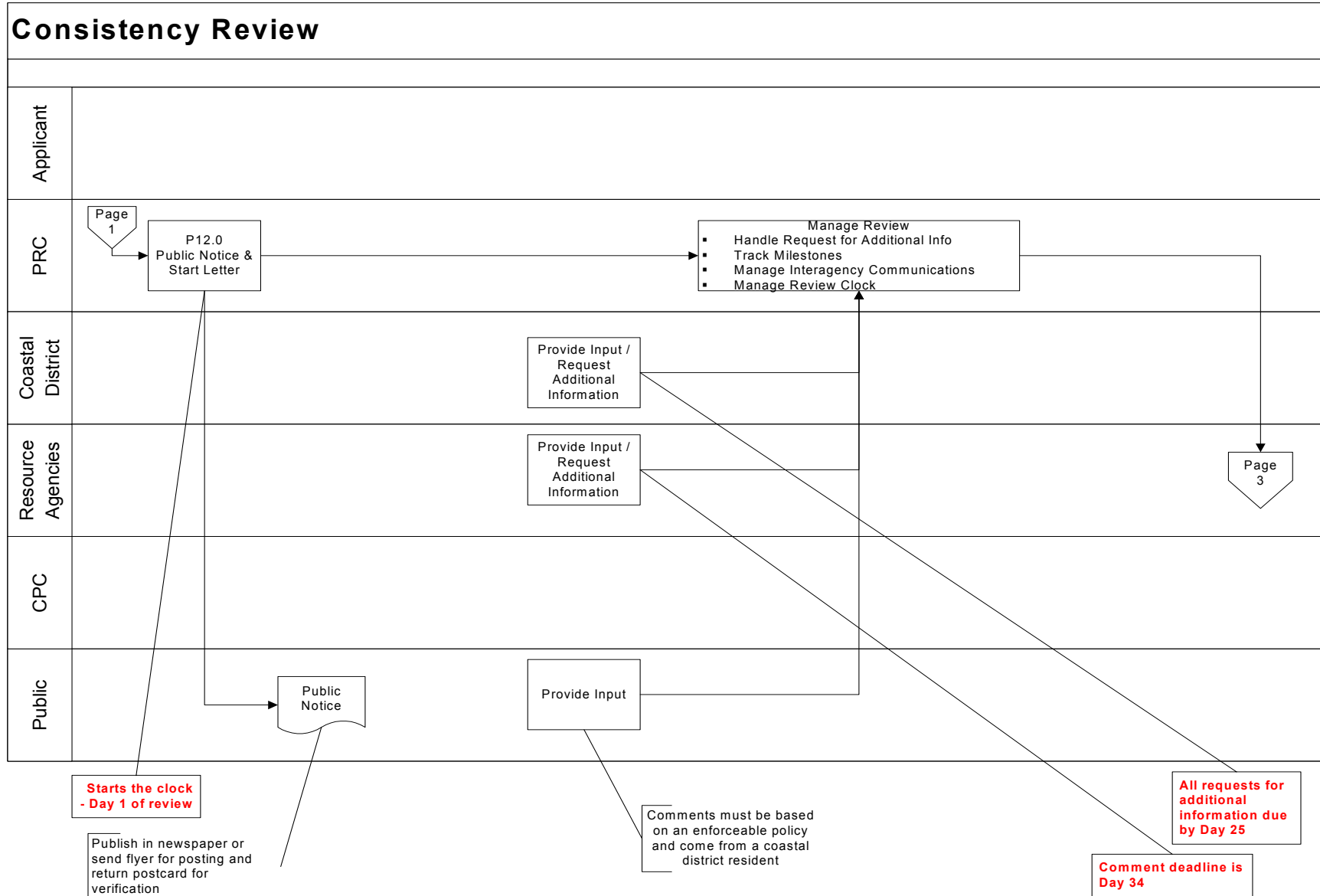
Consistency Review Flow Chart

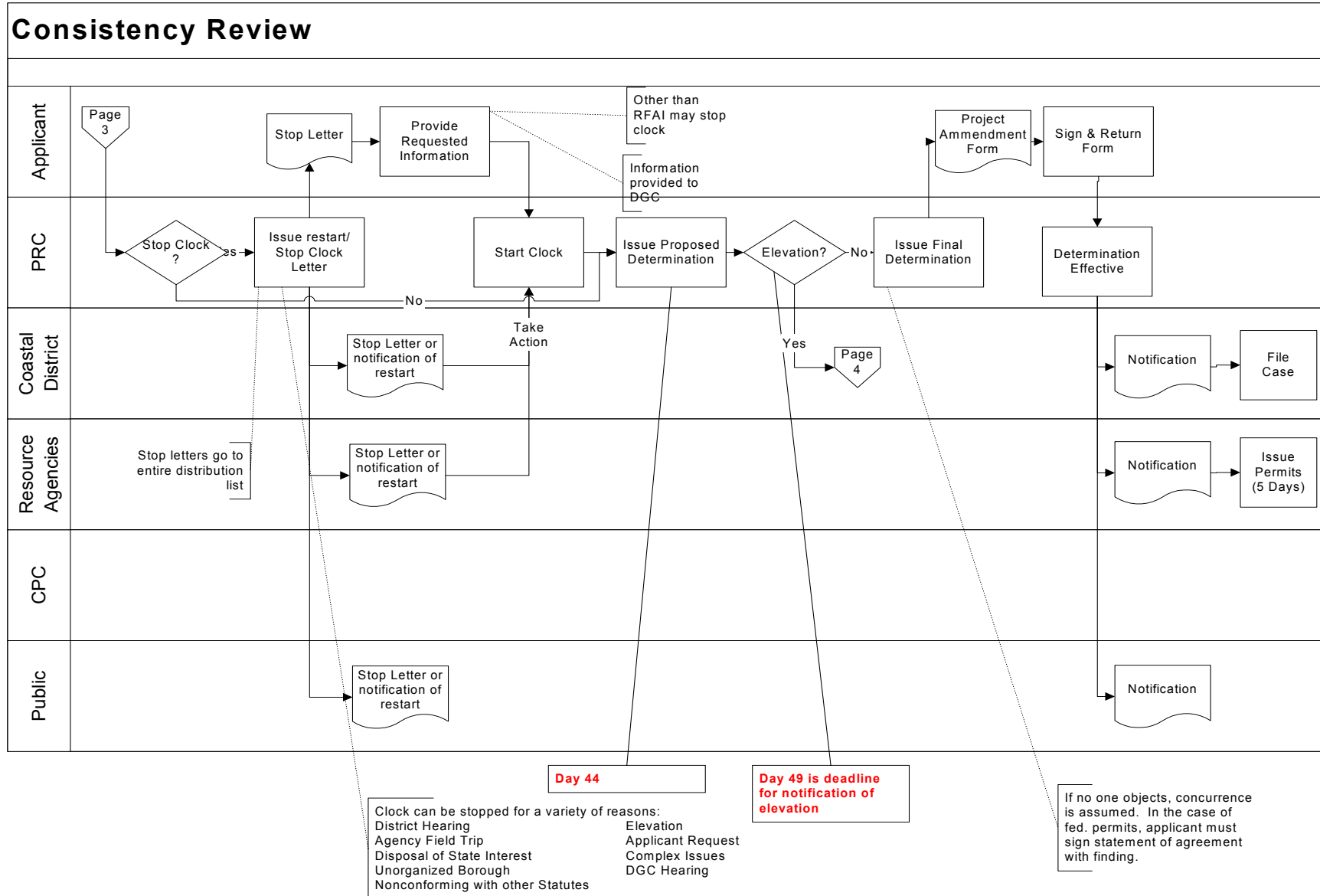
The consistency review process for the Alaska Coastal Management Program represents one of the more complicated approvals the Department of Natural Resources would like supported by its permitting software. Following is a flow chart of the consistency review process. Following the flow chart is a narrative explanation of the consistency review process and some sample questions from the questionnaire that is used to determine which permits a particular development project might require.

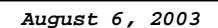
If you have questions, contact Chas Dense at 907 465-8789.



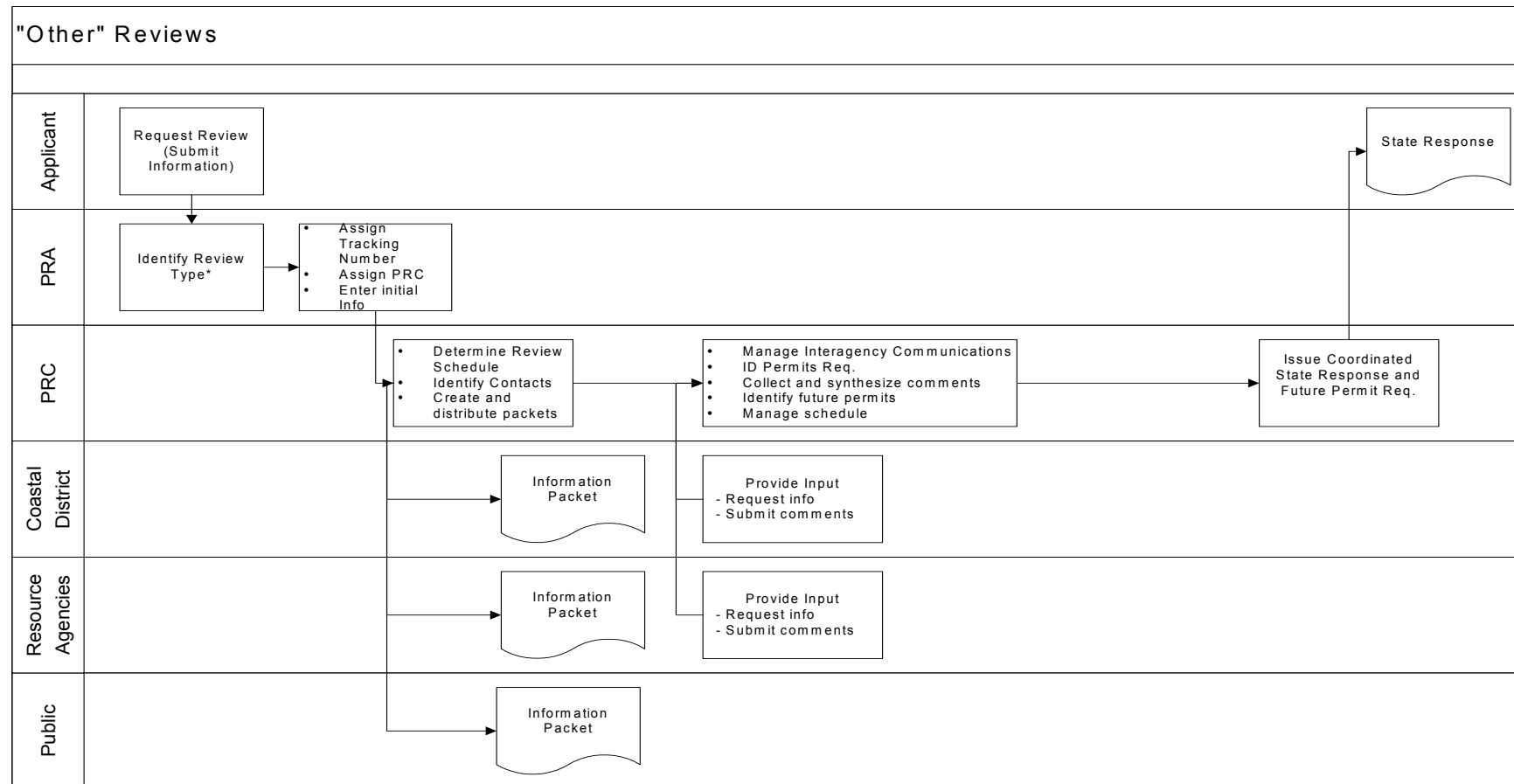








Appendix I. “Other” Reviews



* May relate to future consistency review.

Reviews include:

- Pre construction notification
- Scoping
- NEPA
- ANILCA
- Federal MOU
- Schedule of proposed actions (SOPA)
- Negative determination

Rev 3.1

Appendix II. Coastal Project Questionnaire Instructions

ALASKA COASTAL MANAGEMENT PROGRAM

CONSISTENCY REVIEW INSTRUCTIONS COASTAL PROJECT QUESTIONNAIRE (CPQ)

Dear Applicant or Federal Project Proponent:

The State of Alaska uses a multiple agency coordinated system for reviewing and processing all resource-related permits which are required for proposed projects in or affecting coastal areas of Alaska. This system, called "project consistency review," is based on the Alaska Coastal Management Program (ACMP) and is designed to improve management of Alaska's coastal land and water uses. Project proposals are reviewed to determine the project's consistency with the standards of the ACMP and enforceable policies of approved district coastal management programs.

Participants in the State's review process include:

- . You, the applicant;
- . State resource agencies (Alaska Departments of Environmental Conservation (DEC), Fish and Game (DFG), and Natural Resources (DNR));
- . The Division of Governmental Coordination (DGC);
- . The affected local coastal community; and
- . Other interested members of the public.

Your answers to this Coastal Project Questionnaire (CPQ) will determine State and federal permitting requirements as well as which State agency will coordinate the consistency review. Please be advised that the CPQ identifies permits subject to a consistency review. You may need additional permits from other agencies or local governments to proceed with your activity. DGC will coordinate the review if:

- . The project is a federal activity;
- . The project requires a federal government approval; or
- . The project requires permits from more than one State agency.

All other reviews will be coordinated by the State agency responsible for issuing those permits.

The State considers all aspects of a proposed activity in a single consistency review. Your answers to the questions must reflect all elements of the activity, and all applications for the entire project must be submitted together. This approach eliminates repetitive ACMP reviews and decisions on the same project. However, you should be advised that individual permits may still need further review by issuing agencies for non-ACMP concerns upon completion of the ACMP consistency review.

Before you finalize project plans and submit your application, the State can arrange a preapplication meeting among review participants and yourself to review your draft plans. This meeting identifies concerns, information needs and promotes a mutual understanding of your project. To arrange a preapplication meeting, contact the coordinating agency. In lieu of a meeting, the coordinating agency can distribute materials to review participants for preapplication assistance.

For all projects proposed by applicants and federal agencies the consistency review begins upon receipt of your **complete application packet** by the coordinating agency. A complete application packet includes:

- A completed, signed CPQ;

- **Copies** of any necessary State and/or federal applications, topographic maps and plan drawings required by the approving agency(ies) (**ORIGINALS** go to the State or federal issuing agency. Fees associated with a State permit must be submitted to the issuing agency.); and

- Any additional pertinent information, including public notices from agencies.

You must submit the completed packet to the regional office where the proposed project is located. Attached are a list of regional agency contacts and a map of the coastal area with the regions delineated. All packets must be submitted to DGC, with the following exceptions:

- If your application packet includes an application which contains confidential information, submit that application **ONLY** to the applicable State agency, and the remainder of the packet to the coordinating agency.

- If the project involves placer mining, submit an Annual Placer Mining Application (instead of the CPQ) to DNR, Division of Mining.

- If you need permits from only one State agency and no federal agencies, submit the entire packet to that State agency.

- If you are applying to grow shellfish or aquatic plants, you must submit an aquatic farm application packet to DNR during the scheduled filing period.

Some projects that will have no significant impact on coastal resources, or that are routine activities, may be exempt from individual consistency review requirements. These projects are called "categorical permits" or "general concurrence determinations," respectively. The State maintains a list identifying permits and projects that qualify for these categories of expedited review. The list is referred to as the "Classification of State Agency Permits" (ABC List). Applicants must complete the CPQ so the State can determine whether a proposed project qualifies for an expedited review. Contact DGC for more information.

REVIEW OF YOUR PROJECT WILL BEGIN WHEN THE COORDINATING AGENCY HAS DETERMINED THAT THE APPLICATION PACKET IS COMPLETE.

STEPS IN THE ACMP CONSISTENCY REVIEW PROCESS*

The State must complete the consistency review of your project within 30 or 50 days*. A 50-day review schedule will be used for projects with permits requiring a 30-day public notice. The review schedule may be extended as provided in 6 AAC 50.110(b). The provisions include extensions requested by the applicant and requests for additional information by a review participant.

Division of Governmental Coordination**Software Requirements Specification**

	30-Day Review	50-Day Review
Start-Up: When the consistency review begins you will receive a review number and review schedule.	Day 1	Day 1
Information Requests: Deadline for reviewers to request additional information. The review may be stopped until that information is received.	Day 15	Day 25
Comment Deadline: Public, district and agency reviewer comments due.	Day 17	Day 34
Proposed Determination: The coordinating agency will develop a proposed consistency determination that will be presented to you and reviewers for concurrence.	Day 25	Day 44
Deadline for notification of elevation and/or petition**	Day 29	Day 49
Final Determination: A final consistency determination will be issued upon agreement of the proposed determination by you and reviewers unless an elevation and/or petition is requested.	Day 30	Day 50
Elevation Process: If elevated, directors' determination	Day 45	Day 65
Elevation Process: If elevated again, Commissioners' determination	Within 15 days following elevation request	
Petition to the Coastal Policy Council	Council decision within 50 days following issuance of proposed consistency determination	

* Some projects may require a different review process/schedule (such as federal activities and projects that involve a disposal of interest in State land or resources).

**Elevation/Petition Process: Elevation is an appeal process that allows further review of the merits of the proposed consistency determination by the State resource agency division directors and commissioners. Each elevation review lasts a maximum of 15 days. The petition process allows the applicant, resource agencies, an affected coastal district, or citizen of an affected coastal district to seek Coastal Policy Council review of the proposed determination; the CPC reviews whether the coordinating agency fairly considered the petitioner's comments regarding consistency with an affected coastal district's enforceable policies during the development of the proposed consistency determination. Each petition review lasts a maximum of 50 days.

Permits: State agencies issue permits covered by the conclusive consistency determination within five days after the final determination is issued, unless an agency finds that additional review is necessary to fulfill its statutory requirements. DGC can provide you with more information on additional permit reviews that may be necessary for your project.

If your project requires a federal approval and you disagree with the State's final conclusive consistency determination, you may also appeal to the U.S. Secretary of Commerce in Washington, D.C., as provided in 15 CFR 930.125(h). DGC can provide you information on this appeal process upon request.

PLEASE DETACH AND KEEP THE INSTRUCTION SECTION AND CONTACT LIST OF THIS

FORM

■ DEPARTMENT OF FISH & GAME (DFG) APPROVALS

1. Will you be working in, removing water or material from, or placing anything in, a stream, river or lake? (This includes work or activities below the ordinary high water mark or on ice, in the active flood plain, on islands, in or on the face of the banks, or, for streams entering or flowing through tidelands, above the level of mean lower low tide.)

- *Note: If the proposed project is located within a special flood hazard area, a floodplain development permit may be required.*
- *Contact the affected city or borough planning department for additional information and a floodplain determination.)* ☐ ☐

Name of waterbody: ____

2. Will you do any of the following: ☐ ☐

Please indicate below:

- | | |
|--|--|
| <input type="checkbox"/> Build a dam, river training structure, other instream impoundment, or weir | <input type="checkbox"/> Build a bridge (including an ice bridge) |
| <input type="checkbox"/> Use the water | <input type="checkbox"/> Use the stream, lake or waterbody as a road (even when frozen), or cross the stream with tracked or wheeled vehicles, log-dragging or excavation equipment (backhoes, bulldozers, etc.) |
| <input type="checkbox"/> Pump water into or out of stream or lake (including dry channels) | <input type="checkbox"/> Install a culvert or other drainage structure |
| <input type="checkbox"/> Divert or alter the natural stream channel | <input type="checkbox"/> Construct, place, excavate, dispose or remove any material below the ordinary high water of a waterbody |
| <input type="checkbox"/> Change the water flow or the stream channel | <input type="checkbox"/> Construct a storm water discharge or drain into the waterbody |
| <input type="checkbox"/> Introduce silt, gravel, rock, petroleum products, debris, brush, trees, chemicals, or other organic/inorganic material, including waste of any type, into the water | <input type="checkbox"/> Place pilings or anchors |
| <input type="checkbox"/> Alter, stabilize or restore the banks of a river, stream or lake (provide number of linear feet affected along the bank(s)) | <input type="checkbox"/> Construct a dock |
| <input type="checkbox"/> Mine, dig in, or remove material, including woody debris, from the beds or banks of a waterbody | <input type="checkbox"/> Construct a utility line crossing |
| <input type="checkbox"/> Use explosives in or near a waterbody | <input type="checkbox"/> Maintain or repair an existing structure |
| | <input type="checkbox"/> Use an instream in-water structure not mentioned here |

Yes

No

3. Is your project located in a designated State Game Refuge, Critical Habitat Area or State Game Sanctuary? ☐ ☐

4. Does your project include the construction/operation of a salmon hatchery? ☐ ☐
5. Does your project affect, or is it related to, a previously permitted salmon hatchery? ☐ ☐
6. Does your project include the construction of an aquatic farm? ☐ ☐

If you answered "No" to ALL questions in this section, continue to next section.

If you answered "Yes" to ANY questions under 1-3, contact the Regional or Area DFG Habitat and Restoration

Division Office for information and application forms.

If you answered "Yes" to ANY questions under 4-6, contact the DFG Commercial Fisheries Division headquarters for information and application forms.

Based on your discussion with DFG, please complete the following:

Types of project approvals or permits needed

Date application submitted

If you answered "YES" to any questions in this section and are not applying for DFG permits, indicate reason:

- ☐ ____ (DFG contact) told me on ____ that no DFG approvals are required on this project because ____
- ☐ Other: ____

■ DEPARTMENT OF NATURAL RESOURCES (DNR) APPROVALS

1. Is the proposed project on State-owned land or water or will you need to cross State-owned land for access? ("Access" includes temporary access for construction purposes. *Note: In addition to State-owned uplands,*

the State owns almost all land below the ordinary high water line of navigable streams, rivers and lakes, and below the

mean high tide line seaward for three miles.) ☐ ☐

a) Is this project for a commercial activity? ☐ ☐

2. Is the project on Alaska Mental Health Trust land (AMHT) or will you need to cross AMHT land?
Note: Alaska Mental Health Trust land is not considered State land for the purpose of ACMP reviews.
☐ ☐

3. Do you plan to dredge or otherwise excavate/remove materials on State-owned land? ☐ ☐

Location of dredging site if different than the project site: ____

Township _____ Range _____ Section _____ Meridian _____ USGS Quad

Map ____

4. Do you plan to place fill or dredged material on State-owned land? ☐ ☐

Location of fill disposal site if other than the project site: ____

Township _____ Range _____ Section _____ Meridian _____ USGS Quad

Map ____

Source is on: ☐ State Land ☐ Federal Land ☐ Private Land ☐ Municipal Land

5. Do you plan to use any of the following State-owned resources: ☐ ☐

☐ **Timber:** Will you be harvesting timber? Amount: ____

☐ *Materials such as rock, sand or gravel, peat, soil, overburden, etc.:*

Which material? ____ Amount: ____

Location of source: ☐ Project site ☐ Other, describe: ____

Township _____ Range _____ Section _____ Meridian _____ USGS Quad

Map ____

Yes No

6. Are you planning to divert, impound, withdraw, or use any fresh water, except from an existing public water system or roof rain catchment system (regardless of land ownership)? ☐ ☐

Amount (maximum daily, not average, in gallons per day): __

Source: _____ Intended Use: _____

- If yes, will your project affect the availability of water to anyone holding water rights to that water? ☐ ☐

7. Will you be building or altering a dam (regardless of land ownership)? ☐ ☐

8. Do you plan to drill a geothermal well (regardless of land ownership)? ☐ ☐

9. At any one site (regardless of land ownership), do you plan to do any of the following? ☐ ☐

- ☐ Mine five or more acres over a year's time
☐ Mine 50,000 cubic yards or more of materials (rock, sand or gravel, soil, peat, overburden, etc.) over a year's time
☐ Have a cumulative unreclaimed mined area of five or more acres

If yes to any of the above, contact DNR about a reclamation plan.

If you plan to mine less than the acreage/amount stated above and have a cumulative unreclaimed mined area of less than five acres, do you intend to file a voluntary reclamation plan for approval? ☐ ☐

10. Will you be exploring for or extracting coal? ☐ ☐

11. a) Will you be exploring for or producing oil and gas? ☐ ☐
 b) Will you be conducting surface use activities on an oil and gas lease or within an oil and gas unit? ☐ ☐

12. Will you be investigating, removing, or impacting historical or archaeological or paleontological resources (anything over 50 years old) on State-owned land? ☐ ☐

13. Is the proposed project located within a known geophysical hazard area? ☐ ☐

Note: 6 AAC 80.900(9) defines geophysical hazard areas as "those areas which present a threat to life or property from

geophysical or geological hazards, including flooding, tsunami run-up, storm surge run-up, landslides, snowslides, faults,

ice hazards, erosion, and littoral beach process." "known geophysical hazard area" means any area identified in a report or

map published by a federal, state, or local agency, or by a geological or engineering consulting firm, or generally known by

local knowledge, as having known or potential hazards from geologic, seismic, or hydrologic processes.

14. Is the proposed project located in a unit of the Alaska State Park System? ☐ ☐

**If you answered "No" to ALL questions in this section, continue to Federal Approvals section.
 If you answered "Yes" to ANY questions in this section, contact DNR for information.**

Based on your discussion with DNR, please complete the following:

Types of project approvals or permits needed

Date application submitted

If you answered "YES" to any questions in this section and are not applying for DNR permits, indicate reason:

- ☐ ____ (DNR contact) told me on ____ that no DNR approvals are required on this project because_
- ☐ Other: ____

■ FEDERAL APPROVALS

Yes No

U.S. Army Corps of Engineers (COE)

1. Will you be dredging or placing structures or fills in any of the following:

tidal (ocean) waters? streams? lakes? wetlands*? ☐ ☐

If yes, have you applied for a COE permit? ☐ ☐

Date of submittal: __

- *(Note: Your application for this activity to the COE also serves as application for DEC Water Quality Certification.)*

**If you are not certain whether your proposed project is in a wetlands (wetlands include muskegs), contact the COE,*

Regulatory Branch at (907) 753-2720 for a wetlands determination (outside the Anchorage area call toll free 1-800-478-2712).

Bureau of Land Management (BLM)

2. Is the proposed project located on BLM land, or will you need to cross BLM land for access? ☐ ☐

If yes, have you applied for a BLM permit or approval? ☐ ☐

Date of submittal: __

U.S. Coast Guard (USCG)

3. a) Will you be constructing a bridge or causeway over tidal (ocean) waters, or navigable rivers, streams or lakes? ☐ ☐

b) Does your project involve building an access to an island? ☐ ☐

c) Will you be siting, constructing, or operating a deepwater port? ☐ ☐

If yes, have you applied for a USCG permit? ☐ ☐

Date of submittal: __

U.S. Environmental Protection Agency (EPA)

4. a) Will the proposed project have a discharge to any waters? ☐ ☐

b) Will you be disposing of sewage sludge (contact EPA at 206-553-1941)? ☐ ☐

If you answered yes to a) or b), have you applied for an EPA National Pollution Discharge Elimination System (NPDES) permit? ☐ ☐

Date of submittal: __

(Note: For information regarding the need for an NPDES permit, contact EPA at (800) 424-4372.)

c) Will construction of your project expose 5 or more acres of soil? *(This applies to the total amount of land disturbed, even if disturbance is distributed over more than one season, and also applies to areas that are part of*

a larger common plan of development or sale.) ☐ ☐

d) Is your project an industrial facility which will have stormwater discharge which is directly related to manufacturing, processing, or raw materials storage areas at an industrial plant? ☐ ☐

If you answered yes to c) or d), your project may require an NPDES Stormwater permit.

Contact EPA at 206-553-8399.

Federal Aviation Administration (FAA)

5. a) Is your project located within five miles of any public airport? ☐ ☐

b) Will you have a waste discharge that is likely to decay within 5,000 feet of any public airport? ☐ ☐

If yes, please contact the Airports Division of the FAA at (907) 271-5444.

Federal Energy Regulatory Commission (FERC)

6. a) Does the project include any of the following:
- 1) a non-federal hydroelectric project on any navigable body of water ☐ ☐
 - 2) a location on federal land (including transmission lines) ☐ ☐
 - 3) utilization of surplus water from any federal government dam ☐ ☐
- b) Does the project include construction and operation, or abandonment of natural gas pipeline facilities under sections (b) and (c) of the Federal Power Act (FPA)? ☐ ☐

Yes**No**

- c) Does the project include construction for physical interconnection of electric transmission facilities under section 202 (b) of the FPA? ☐ ☐

If you answered yes to any questions under number 6, have you applied for a permit from FERC? ☐ ☐

Date of submittal: __

(Note: For information, contact FERC, Office of Hydropower Licensing (202) 219-2668; Office of Pipeline Regulation (202) 208-0700; Office of Electric Power Regulation (202) 208-1200.)

U.S. Forest Service (USFS)

7. a) Does the proposed project involve construction on USFS land? ☐ ☐
- b) Does the proposed project involve the crossing of USFS land with a water line? ☐ ☐
- If the answer to either question is yes, have you applied for a USFS permit or approval? ☐ ☐
- Date of submittal: __

APPENDIX 3: TASK 3: SHARED GEOGRAPHIC INFORMATION SYSTEM

State of Alaska GIS: ("alaskadata.info")

Note: This document was shared with project participants and helped with the decision making tied to the Phase I implementation. Additional information will be provided in the following Technical Report.

Introduction

Geographic information plays a key role in the business of state government. Although several agencies have implemented independent GIS infrastructures and have dedicated support personnel, other agencies cannot afford the high cost of entry for this important decision-support tool. While agencies have a history of working together to share data and expertise, current projects require a shared systems approach to GIS. This paper is a summary of the requirements for building a shared, multi-agency GIS. The paper is organized as follows:

- 1: Shared GIS Concept
- 2: System Architecture
- 3: Data Management
- 4: Staffing Issues
- 5: Cost Center Summary

Appendix A: Initial Participants and Leading Projects

Appendix B: Specific technical requirements for system architecture

Appendix C: Data layers currently in DNR's Oracle-based GIS repository

Appendix D: Current State of Alaska WAN Architecture Diagram

Appendix E: FAQ about the AlaskaData.info concept

Appendix F: Detailed cost estimates and related information

Based on agency response to this document, a funding and implementation plan can be developed. This will be used as the basis for ITG to generate technical recommendations for creating a shared GIS infrastructure.

Shared GIS Concept: AlaskaData.info

The idea of building a shared GIS that ties to agency business applications has been around for a long time. Two significant changes at an industry level have opened the door to a meaningful approach to creating a shared GIS. First, GIS data can now be stored in relational databases subject to standard data-center business practices; second, data standards are emerging from the Open GIS Consortium that promise to permit interoperable systems among commercial software packages. Both of these are important and relatively recent developments.

The alaskadata.info concept takes advantage of the migration from file-based GIS to a database repository that contains the various "layers" of GIS information. Responsibility for updating and maintaining any given layer is tied to the mission of the agency. For example, an extremely brief list of agencies and data layers is:

- DOTPF updates road centerline layers
- DNR-LRIS updates land status layers
- DNR-Forestry updates forestry-related layers
- DCED updates Community Profiles layers
- DEC updates point source layers
- ADFG updates fish streams layers
- AOGCC updates oil and gas wells layers
- DGC updates coastal data layers

Each layer has only one source for updates. The data are shared by all for viewing, mapping, reporting, queries, and business applications. Additionally, Federal Agencies such as USGS and BLM are encouraged to contribute data as well, resulting in the most comprehensive collection of Alaska GIS data possible.

The GIS literature has many references to the benefits of building a shared GIS (Google “benefits of GIS”). We have identified the following benefits of implementing an Alaska shared GIS:

- 1). Accessibility. All users have access to the same, non-duplicated geographic data. This provides for consistency between land management decisions and agency business functions. Additionally, it provides an opportunity for the general public to have access to the same information which is used for various agency decision-making processes.
- 2). Efficiency & Cost Reduction. Currently, many agencies are spending time and money to maintain duplicate data. A shared GIS allows an agency to only maintain data it creates. This benefit alone has generated benefit-cost ratios in excess of 4:1 on other shared GIS projects. Additionally, by lowering the costs of entry, agencies currently unable to take advantage of GIS-supported decision-making are more able to do so.
- 3). Flexibility. Information contained within the shared GIS is usable in three ways:
 - With commercial desktop GIS packages, such as Arc/Info, MapInfo, etc.
 - With commercial Internet Mapping packages, such as ArcIMS, MapXtreme, etc.
 - With custom-written business applications which meet agency needs.
- 4). Functionality. Agency technical staff can incorporate GIS data and spatial functionality into business applications which currently use only tabular data residing on the mainframe and other systems. These new applications can improve efficiency, reduce cycle times, and provide additional cost savings.
- 5). Leverage Assets. By creating a shared set of standards and protocols for developing and working with geo-spatial data, we can ensure the data use is as broad as possible, effectively reducing the “cost per use” of GIS data.
- 6). Advances the goals of the State of Alaska GIS Strategic Plan (November 2000) and the Statewide Information Technology Plan (November 2002). These goals include:
 - Avoid redundant data collection.

- Provide a forum for the exchange of ideas and information among agencies developing GIS.
- Promote sharing of Geographic Information among government agencies, other organizations and the public.
- Enhance decision making processes for agencies using GIS.
- Promote educational opportunities to enhance awareness of geography, maps, and information systems and its usefulness in government decision making.
- Promote compatibility through standards.
- Maximize the return on the state's investment in technology and data.
- Promote the ability for individuals to browse existing information, determine if it will work for them, and to use it easily and efficiently.

7). Provides the means to create a partnership with the University of Alaska on GIS development goals.

8). Advances Alaska's contribution to the national goal of building National Spatial Data Infrastructure and may create future funding opportunities to complete work on the seven national data layers by demonstrating key progress.

System Architecture

To be successful, a shared GIS must be built upon a system architecture which means current and future needs in terms of deployability, performance, reliability, scalability, compatibility, data storage, system security, sustainability and budget. DNR and ITG staff have worked with other agency staff to develop the initial general requirements which meet these needs. This section outlines the known requirements information gathered at this time.

Shared GIS components include the following:

- GIS software, including Oracle w/Spatial option, ArcSDE, and MapXtreme.
- A database server
- An application server
- Mass storage w/adequate backup system
- High-speed (GB or better) networking among system components
- High-speed Internet accessibility

Depending on the costs and funding available, options include:

- Load balancing and fault-tolerance features (additional database servers)
- Alternative application servers to meet individual agency needs

GIS System Software

The minimum solution includes Oracle 9i w/Spatial option, ArcSDE 8.x, and MapXtreme Java Edition 4.5. This software is required to make the shared GIS compatible with existing enterprise-level efforts and with desktop GIS software widely used by state agencies (ESRI's Arc/Info suite). The goal is to develop a system which is potentially usable by GIS client software from several vendors, including ESRI, MapInfo, and

AutoDesk.

Database Server

While the promise of GIS on Linux/390 database server is enticing, preliminary analysis reveals that particular solution is probably not feasible for the near future. Two alternatives have been suggested for review:

- A Sun mid-range 64-bit solution which is viable for a two to four year initial period.
- A UNIX or Linux cluster which composed of cheaper machines, but is more complex to implement and maintain and carries higher software costs.

The solution must be capable of running a minimum of three database instances (production, test, and development) under intense load.

Application Server

A key component of the shared GIS is providing a common development, test, and production environment for GIS-based business applications. A suitable UNIX-based environment for running these applications is required. The environment architecture must be self-contained, providing all tools necessary for application development and capable of complete separation of application environments (production, test, and development). To meet performance standards, the application server must have high speed connections to both the database and the Internet. By providing this environment via the shared GIS model, individual agencies and their contractors are relieved from the heavy burden of maintaining an environment themselves and can instead concentrate on building the applications needed to fulfill the agency's mission. Agencies are not precluded from using their own development environments. As with the GIS database itself, this resource is "just there" for the use of participating agencies, should they choose to take advantage of it. Additionally, providing a documented and supported application environment permits agency RFP writers to constrain contractor-supplied solutions to a defined standard.

Mass Storage

GIS requires the storage and use of large amounts of data. Mass storage used for a shared GIS must provide sufficient capacity and meet standards for performance and reliability. Currently, we anticipate requiring a minimum of 1TB of initial storage. It is not unreasonable to expect storage requirements to increase by a minimum of 25% per year for the first three years. The recommended solution is a Network Appliance located at the primary production site, with a mirrored unit located at the failover site. This option permits incremental growth and a centralized backup strategy using Trivoli Storage Manager or other solutions currently implmented by ITG. Storage costs would be aligned with the volume of data each agency contributes to the GIS with some shared contribution to the base map storage.

Network Requirements

WAN-based GIS must have acceptable response time for end users. Our recommended

performance standard for a shared GIS infrastructure is a five-second response time. This means the system must be capable of fulfilling any data or map request within three seconds. Both the network and the underlying system components must be capable of supporting this expectation. Changes planned for the state's wide area network support the movement toward a shared GIS. Major expansions of network bandwidth are planned as shown in Appendix D. New routing configurations are being planned to keep Alaska traffic within Alaska, also speeding response time.

Specific technical requirements and other details of system architecture are located in Appendix B.

Data Management

While individual agencies will continue to have complete management of local GIS data, it's also necessary to have a management strategy for data storage within the shared GIS. For agencies to use and rely upon shared GIS data, they must be assured the data meets certain standards in terms of characteristics, quality, currency, security, and documentation. Providing this assurance requires dedicated data and system administration support. Data originators work with these personnel to ensure proper and timely data distribution.

Centralized Storage with Distributed Access

This plan calls for GIS data within a single shared environment. This approach is less complex, cheaper, faster, and more reliable than an equivalent distributed model. The plan does not require agencies to place all of their data within the model, nor does it require agencies to place their only copy of data within the model. The shared database simply becomes the preferred distribution point for sharing data with others. This is similar to what we currently do with Alaska State Geospatial Data Clearinghouse (ASGDC) – the only difference is in how the data is stored. To meet the needs of users in non-hub communities with less than optimum Internet connections, we will continue to make layers of shared data available for download via ASGDC. This will permit users to load data directly to a local GIS workstation to perform analysis and make maps.

The shared GIS may also serve as an agency's production database. This has the advantage of not requiring replication, and assures other departments and the public that the information used by the agency is the same information being provided to others. It also offers the opportunity to move closer to real-time mapping systems as GIS updates are automated as part of normal business process within an agency, for example spatial information associated with execution of a permit. In DNR's case, the shared GIS environment is intended to be the production database for basemap and state land status records.

Data Standards

It is still convenient to view GIS data from the traditional 'layered' approach. The implementation plan will require a detailed listing the layers being planned for the GIS, including which agency will be responsible for layer updates. A well documented update strategy is essential to assure the viability of the shared GIS effort. When using data

provided by others, it's necessary to know what one is getting in terms of original source, quality, and other factors. This "metadata" must be provided by a contributing agency when the data is submitted for inclusion within the shared GIS. Data standards work will build on efforts already undertaken by the Coastal Policy Council and others which references use of the Federal Geographic Data Committee metadata standard. This standard is recommended to meet our documentation needs.

Application Programming

Delivery of GIS functionality outside the shared GIS environment will be the responsibility of supporting agencies. DNR can offer some building blocks that can assist with the development of GIS applications. DNR will make current software applications with source code available. The primary application is called LAS Mapper, a product to display land status information. There is also a variation called Tidelands Mapper, a joint project with DEC to help meet the needs of spill response for both agencies. This is Java based code developed using the MapInfo MapXtreme product. Other agencies have also developed GIS applications that can be shared. For example, AOGCC is developing a GIS with a MS Access front end that connects to SQL server backend. The source code for this Visual Basic and Access application can also be made available. Other departments also have methods and components that can be shared.

Staffing Issues

The State Data Center is the recommended location for creating the shared GIS environment. The advantages include: technical support, access to advanced storage and backup systems, access to high speed network hubs, mainframe access infrastructure, direct access to web services and XML databases, experience with mid-range Unix servers, access to spares, project management skills, and management options through administration of the Information Services Fund, including hardware depreciation model and maintenance costs. If ITG can support the basic infrastructure of this system, the technical resources within agencies can be directed at system development and end user support.

There are three key roles identified to build a successful shared GIS. These roles would initially be split between ITG and DNR to take advantage of the relative strengths in providing a common solution. These roles are System Administration, Oracle Database Administration, and Geospatial Data Administration.

System Administrator

This function includes operation and maintenance of the hardware and system software which powers the Alaska eGIS and related computers. Initially this includes the actual machine Oracle is running on as well as any dedicated application servers which are part of the Alaska eGIS solution, attached storage devices, and backup services.

Oracle Database Administrator (DBA)

Managing a full-scale relational database management system (such as Oracle) requires specialized technical skills. While the GIS Data Administrator is an expert in GIS data and the issues which surround it, the DBA is an expert in the operation and maintenance

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of the Oracle database installation. The DBA is responsible for ensuring the continued health and well-being of the database installation itself. The DBA monitors and adjusts the database to meet desired performance characteristics and responds to requests from application developers and the GIS Data Administrator, rather than end-users. Dedicated DBA services are critical to the success of the shared GIS. This position requires a trained backup person both to assist with day-to-day operations and to assume primary duties as required.

GIS Data Administrator (GDA)

Management of the many layers of shared GIS data contributed from multiple sources is the responsibility of the GIS Data Administrator. The GDA works with data originators to determine agency data security requirements, provide advice and assistance with metadata completion, and establish data layers within the shared GIS. A key duty of the GDA is to act as a liaison between data originators and application developers which use GIS data within their software. Developers must be informed when new data layers are created or major updates to existing data layers occur, so that applications can be updated to take advantage of the new data. The GDA is also responsible for ensuring all data within the shared GIS complies with relevant protocols and standards and making the data available for download (if appropriate) via the Alaska State Geospatial Data Clearinghouse (ASGDC). Finally, the GDA acts as the primary point of reference for questions relating to data residing within the shared GIS and is responsible for the day-to-day management of both ASGDC and the shared GIS itself. This position requires a trained backup person both to assist with day-to-day operations and to assume primary duties as required.

During the initial 18-24 month rollout period, the proposed staffing model is:

Position	Primary	Secondary
GIS Data Admin (GDA)	DNR	DNR
Database Admin (DBA)	DNR	ITG
System Admin	ITG	ITG

(Note: Phase I implementation will vary from this initial proposal.)

The position of primary GDA is presently being recruited as part of the multi-agency PUMP III (Energy Grant) Project. The position will be funded through FY05 with funds from the PUMP III grant and other funded projects. The position of secondary GDA may be filled via a partnership with USGS which will have lead responsibility for basemap updates as related by the national geospatial framework layers (see <http://fgdc.gov>).

The position of primary DBA is filled by DNR staff currently funded by various DNR projects. In the future, this position would be funded via the shared GIS project. The backup DBA position will be staffed by ITG.

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Task Structure

(Note: Phase I implementation will vary from this initial proposal.)

Area	Initial Responsibility
Lead purchase and install of hardware, software, etc.	ITG
Provide backup services	ITG
Provide storage services	ITG
Provide hardware support	ITG
Provide system software support	ITG
Provide and maintain network connectivity	ITG
Provide financial management (including depreciation, chargeback, etc.)	ITG
Application Environment Administration	ITG
Database Administration / Management	DNR
GIS Data Administration / Management	DNR
User training	DNR
DBA Standards Development & Implementation	DNR/ITG
Application Environment Standards Development & Implementation	DNR/ITG
Project Administration	DNR/ITG

Cost Center Summary

The shared GIS must be a community effort to succeed. A cost share approach is required. Costs categories are divided between startup costs and on-going costs.

A Summary Of Startup Costs:

- Labor for System design and implementation planning
- Acquisition of hardware (CPU, storage, bandwidth, backup devices, network devices, etc.).
- Acquisition of software (Oracle RDBMS, ArcSDE, and other server-level components).
- Labor to install and configure computing infrastructure.
- Labor required to bring the GIS on-line (database administration, data collection and administration, data documentation, etc).
- Labor required to deploy the GIS (establishing policy & procedure, plan of operations, forward planning, on-line documentation, etc.)
- Development of Operational Plan (ops plan).
- Training (system staff and system users as appropriate)

Shared GIS Operational Costs

The need to keep on-going costs to a minimum is understood. Continuing operational costs include:

- Software and hardware support contracts and renewal
- Overall system administration (commercial software/hardware maintenance & growth, etc.)

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- Database administration (technical database management, security, reliability, etc.)
- Application server administration (maintenance of development tools, etc.)
- Data administration (new data sources, data loading, management, documentation, training, public access requests, etc.)
- Data storage costs
- Backup services and disaster recovery costs
- Staff and User training

Funding

Startup: Year 1 & 2

Based on the work product of agency managers, a funding contract between ITG and project participants can be executed and work on the acquisition and installation of the system components can begin. Capital dollars from leading projects will provide the initial funding for servers and commercial software. ITG will be able to leverage existing projects to provide storage and backup / disaster recovery services on an annual cost basis. The funding and staffing to initiate this project is available if the agencies with the need for these services collaborate.

Operations: Year 3 and Out

Operating dollars through management of the Information Services Fund and chargeback mechanisms providing operational support is being explored. A model similar to this is now being implemented to bring XML database capabilities to state agencies, and has been used in the past to deliver enterprise email. By maintaining an appropriately scaled solution to our need for a shared GIS we can keep the annual costs low while providing many benefits to the participating agencies and the various publics we serve.

Appendix 3A: Initial Participants and Leading Projects

The following participants have initiated discussions that identified the need for working together to create a shared GIS among the executive branch agencies. Projects with overlapping goals helped to create this dialog. This is not an exhaustive list of current GIS projects. This draft is an attempt to capture the intent of these conversations and set the basis for creating a formal implementation plan that can include additional participants.

<i>Agency</i>	<i>Leading Projects- Currently Funded</i>
DNR	DOE Energy Grant, Land Records CoreGIS
DGC	DOE Energy Grant, coastal permitting application
DGC	Coastal Impact Assessment Program (CIAP)
AOGCC	Capital Projects for public access, Energy Grant
DOT/PF	Statewide Centerline, Statewide Planning
DOA-ITG	MyAlaska, data center upgrades
DEC	One Stop Program, Air/Water Permit needs
ADFG-DNR	Anadromous Waters Catalog. DOE Energy Grant
DCED	Community Profiles

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USGS	Cooperative State Projects
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Summary of DOE Energy Grant GIS Needs: (a) Create a GIS ‘front-end’ to the Alaska Oil and Gas Conservation Commission database of well information, offer the public the ability to search geographically for wide range of geo-technical information; (b) provide GIS foundation to Division of Governmental Coordination’s effort to improve the coastal consistency review process tied to permitting activities; (c) work with ADFG to complete fishery atlas for the Arctic Region.

Summary of DGC CIAP Project GIS Needs: assure coastal planning communities have access to data and tools for evaluating projects and assessing environmental constraints.

Summary of DOTPF GIS Work: ability to share work on statewide centerline project, improve DOTPF access to land records information related to R/W, access basemap imagery for projects.

Summary of DCED shared GIS: working to utilize an infrastructure for serving the digital copies of the Community Profiles project, a five year effort to map over 180 Alaska communities at high resolution.

Summary of DNR GIS Activity: nearing completion on “CoreGIS Project”, a large effort to consolidate land records into an Oracle database. This project can help provide a key part of the technical foundation for basemap, land records data, and viewing software. See <http://www.dnr.state.ak.us/lris/coregis/> for more info.

There are many other GIS activities going on statewide, most of which can benefit from efforts to create a better means for notifying others of their work, and for sharing the results of the project. The goal of the shared GIS is to be open to all state agencies.

Appendix 3B: Specific Technical Requirements

A Sun-based solution which is viable for a two to four year initial period is recommended. A model using larger Sun boxes was considered, as was a model for a clustered solution using Oracle software. No final decisions have been made, but this model appears to meet our goal of keeping costs down and minimizing the time needed to have a system up and running.

Specific hardware/software recommendations are as follows. Cost estimates are **preliminary**, for planning purposes. This configuration would be for the primary production / test site. Current planning has this installation within the Anchorage Data Center.

(Note: Phase I implementation will vary from this initial proposal. Implementation is moving forward)

I. eGIS Entry Database Server

Sun 480, 2 CPU@ 900 MHz, 32GB RAM
Oracle 9i RDBMS
Oracle Spatial
ESRI ArcSDE

eGIS Map Application Server

Sun 480, 4 CPU@ 900 MHz, 32GB RAM
MapXtreme map server
1u rac. mount Windows Server
ESRI ArcIMS

eGIS Storage Solution

Network Appliance Model 880

eGIS Data Bac.up Solution

Veritas Software with

A failover site can be created via data mirroring and parallel software. By using DNR's present installation, the majority of duplicate costs can be avoided. A database server, oracle software, and backup system exist.